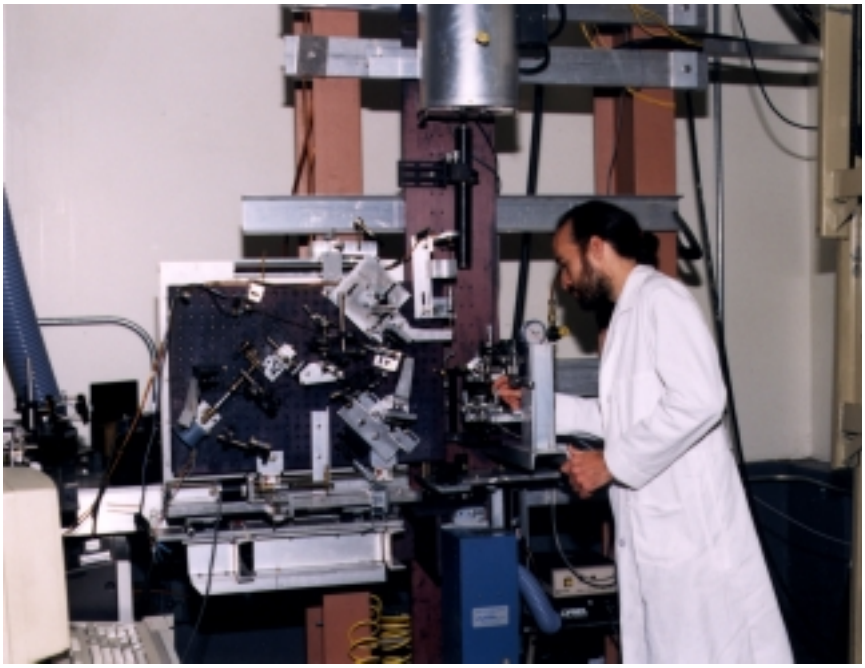
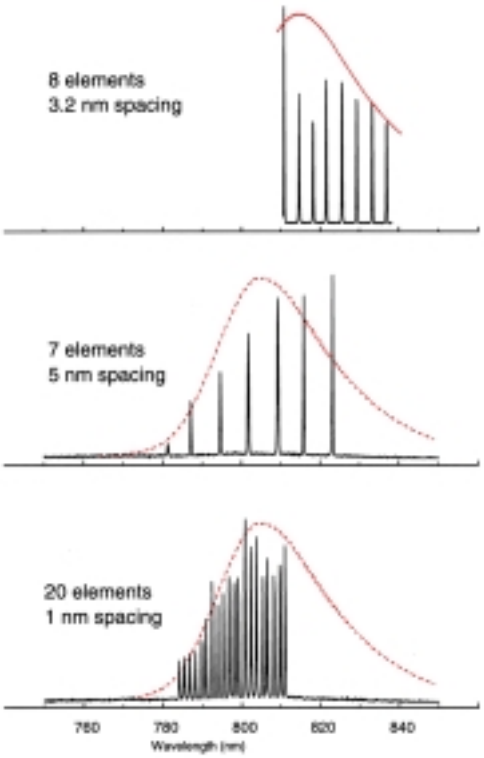
LOW-COST, ON-LINE MANUFACTURING OF FIBER BRAGG GRATINGS



Examples of arrays produced on-line



NRL has developed a technique for producing fiber Bragg gratings (FBGs) *during* the fiber optic drawing process, thereby sharply increasing the production rate, avoiding degradation of fiber strength, and potentially lowering the cost of FBG sensors. Competing FBG production methods are relatively slow and labor-intensive, involving removing the fiber's protective polymer coating or prolonged exposures through specialized coatings. Advantages of the NRL method include:

- Fully automated production control
- Rapid production rates: > 1grating/sec
- Arbitrary selection of inter-grating spacing and Bragg wavelengths
- Controllable reflectivity: <0.1% to <20%

The NRL method is readily adaptable to both conventional and research fiber draw towers. On-line FBG production is an enabling technology that allows efficient manufacture of FBG sensors and sensor arrays for the growing market in distributed point sensing (see separate information sheets on NRL's FBG sensors and demodulation technologies) and other applications, such as diode source stabilization, wavelength division multiplexing, add-drop filters, and wavelength references.

Points of Contact
Naval Research Laboratory
4555 Overlook Avenue, SW • Washington, DC 20375-5320

Jane F. Kuhl • Head, Technology Transfer Office • (202) 767-3083 • kuhl@utopia.nrl.navy.mil
Charles Askins • Optical Sciences Division • (202) 767-1877 • askins@nrl.navy.mil